To: Meiners, Greg Ex. 4 - CBI
From: Jahne, Michael
Sent: Tue 1/9/2018 9:22:40 PM
Subject: RE: Atmospheric Water Generator Study

Hi Greg,

Thanks for the info. I actually spoke with John Hall after sending this, and we agreed that turbidity measurement isn't necessary for this study (and neither is DO or ORP for that matter). Let me know if you need me to relay this to Radha et al. So my question regarding datasheets would only refer to the YSI- you guys will be taking the measurements so copying us works.

Thanks,

Michael

From: Meiners, Greg Ex. 4 - CBI
Sent: Tuesday, January 09, 2018 3:56 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Cc: Hall, John <Hall.John@epa.gov>
Subject: RE: Atmospheric Water Generator Study

Hi Michael,

Attached is the SOP for the Hach 2100P turbidimeter. Also attached is the data sheet that we use. If we are doing the weekly measurements, we can copy you on the instrument calibration checks and sample data. If you are doing the measurements, we can show you how to do it and you can keep the records. The same goes for the YSI 556 and any other data that is required.

Regards,

APTIM

Greg Meiners

Ex. 4 - CBI

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Tuesday, January 09, 2018 3:16 PM
To: Meiners, Greg
Subject: RE: Atmospheric Water Generator Study

Also regarding workflow, you typically record calibration and measurements using the logsheets provided in Appendices and then transfer data electronically to us?

From: Jahne, Michael
Sent: Tuesday, January 09, 2018 2:00 PM
To: 'Meiners, Greg' <Ex. 4 - CBI>
Subject: RE: Atmospheric Water Generator Study

Hi Greg- do you have an SOP for the Hach 2100P turbidimeter?

Thanks,

Michael

From: Meiners, Greg [mailto:Greg.Meiners@aptim.com]
Sent: Thursday, January 04, 2018 3:50 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Subject: RE: Atmospheric Water Generator Study

Here you go!

APTIM

Greg Meiners

Ex. 4 - CBI

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Thursday, January 04, 2018 3:45 PM
To: Meiners, Greg
Subject: RE: Atmospheric Water Generator Study

Ha everyone's favorite. Do you have a copy of this SOP available?

From: Meiners, Greg **Ex. 4 - CBI**
Sent: Thursday, January 04, 2018 3:36 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Subject: RE: Atmospheric Water Generator Study

No problem, we go through the same thing!

APTIM

Greg Meiners

Ex. 4 - CBI

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Thursday, January 04, 2018 3:33 PM
To: Meiners, Greg
Subject: RE: Atmospheric Water Generator Study

Great thank you, will pass along to the QA folks. Appreciate your patience with the back-and-forth, trying to get these documents in place so that we can begin testing.

Thanks,

Michael

From: Meiners, Greg [Ex. 4 - CBI

Sent: Thursday, January 04, 2018 3:26 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>; Hall, John <Hall.John@epa.gov>
Cc: radha.krishnan Ex. 4 - CBI Witt, Sue Ex. 4 - CBI , Kling, Timothy Ex. 4 - CBI
Subject: RE: Atmospheric Water Generator Study

Michael,

We use T&E SOP No. 512 Revision No. 1 (8/28/17) for the Operation of YSI 556 Multi-Probe System in Grab Sampling Mode. This SOP basically follows the manufacturer's instruction manual.

APTIM

Greg Meiners

Ex. 4 - CBI

www.aptim.com

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Thursday, January 04, 2018 3:15 PM
To: Meiners, Greg; Hall, John
Cc: Krishnan, Radha; Witt, Sue; Kling, Timothy
Subject: RE: Atmospheric Water Generator Study

Perfect, thank you! Do you have SOPs or other protocols that you use for these instruments?

Specifically with respect to QA. Chlorine analysis isn't necessary in this case.

Thanks,

Michael

From: Meiners, Greg [Ex. 4 - CBI
Sent: Thursday, January 04, 2018 1:31 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>; Hall, John <Hall.John@epa.gov>
Cc: radha.krishnan[Ex. 4 - CBI] Witt, Sue <[Ex. 4 - CBI]>; Kling, Timothy
[Ex. 4 - CBI]
Subject: RE: Atmospheric Water Generator Study

Michael,

The attached list covers the instruments and calibrations solutions that will be used to analyze the grab samples taken for the WaterGen project. We will be using a YSI 556 for temperature, DO, conductivity, pH & ORP. A Hach 2100P turbidimeter will be used for measuring turbidity. If chlorine determinations are necessary, a Hach DR900 spectrophotometer will be used to measure free and total chlorine. Finally, a Horiba U-53 multiparameter sonde will be used in place of the YSI 556 if needed.

Please let me know if you have any questions.

APTIM

Greg Meiners

Ex. 4 - CBI

Ex. 4 - CBI

From: Jahne, Michael [Jahne.Michael@epa.gov]
Sent: Thursday, January 04, 2018 9:25 AM
To: Hall, John
Cc: Meiners, Greg; Krishnan, Radha
Subject: RE: Atmospheric Water Generator Study

Thanks John. Greg, let me know which probes you will be using and I will include in the QAPP and HASP. Also, what reagents will you be using for calibration etc.? Need to include them in the HASP as well.

Thanks,

Michael

From: Hall, John
Sent: Tuesday, January 02, 2018 9:22 AM
To: Jahne, Michael <Jahne.Michael@epa.gov>
Cc: Meiners, Greg Ex. 4 - CBI; radha.krishnan Ex. 4 - CBI
Subject: RE: Atmospheric Water Generator Study

Sorry I have been gone for so long on use or lose vacation. I am fine with replacing the probes on the YSI. My main concern is keeping it quick and simple for the technician taking the grab samples. In our experience, there are lots of good probes by lots of manufacturers. They all are relatively accurate especially for the intended purpose of these samples from the water condenser. I am happy to upgrade whatever Greg thinks is easiest and quickest to use for this sampling.

Note to Radha: Pay for the probe upgrades if needed out of WA 4-06 but exclude them from the total cost of the supporting the Israeli condenser project because we should probably have a working set of YSI probes for other projects too.

From: Jahne, Michael
Sent: Tuesday, December 19, 2017 5:04 PM
To: Hall, John <Hall.John@epa.gov>
Subject: FW: Atmospheric Water Generator Study

What are your thoughts on cost to service instruments and replace probes?

From: Meiners, Greg [Ex. 4 - CBI]
Sent: Tuesday, December 19, 2017 4:48 PM
To: Jahne, Michael <Jahne.Michael@epa.gov>; Hall, John <Hall.John@epa.gov>
Cc: radha.krishnan[Ex. 4 - CBI]; Kling, Timothy [Ex. 4 - CBI]; Witt, Sue [Ex. 4 - CBI]
Subject: RE: Atmospheric Water Generator Study

Hi Mike,

We have a YSI 556 multiparameter sonde that measures pH, ORP, conductivity, temperature and DO. We also have a Horiba U-53 that measures pH, ORP, conductivity, temperature, DO, turbidity and a calculated/estimated TDS value. True TDS is a manual method that requires filtering, weighing and drying. The turbidity probe on the Horiba is not really suitable for drinking water, it's too clean. It's really made to throw in a pond, lake or stream. We measure drinking water turbidity using a Hach turbidimeter that is located in the BSL-2 lab. This is also a manual method.

Both of the referenced instruments (YSI & Horiba) need new pH/ORP probes, maintenance and calibration. The probes are ~ $700 each. If you decide this is the method(s) to use, please let me know and I can work on getting the sondes in good operating order. Thanks!

APTIM

Greg Meiners

Ex. 4 - CBI

Ex. 4 - CBI

From: Krishnan, Radha
Sent: Tuesday, December 19, 2017 2:08 PM
To: Meiners, Greg; Kling, Timothy; Witt, Sue
Cc: Jahne, Michael; Hall, John (Hall.John@epa.gov)
Subject: RE: Atmospheric Water Generator Study

Greg, can you please coordinate a response to Mike on his information needs for the Water-gen study?

Thanks.

Radha Krishnan, P.E.

Ex. 4 - CBI

Ex. 4 - CBI

From: Jahne, Michael [mailto:Jahne.Michael@epa.gov]
Sent: Tuesday, December 19, 2017 2:04 PM
To: Krishnan, Radha <Ex. 4 - CBI
Cc: Hall, John <Hall.John@epa.gov>
Subject: Atmospheric Water Generator Study

Hi Radha,

I'm organizing the QAPP and HASP for the atmospheric water generator testing at T&E, and wanted to touch bases with you on some of the details. My understanding is that APTIM will operating the unit under John's contract, which will entail monitoring the unit; draining periodically; and recording some basic water quality parameters (temp, pH, conductivity, etc.). A couple of specific questions:

1) What do you have for water quality probes that would work well for this study? Thinking temperature, pH, conductivity, turbidity, and TDS would be of interest but we are flexible depending on what's convenient. I need info on model, calibration, and operation for the

QAPP/HASP; if you already have an SOP that would work too.

2) What and who should I include in the QAPP/HASP on your end? I already have them from the Solstreme study so can cross-reference them as appropriate.

Let me know your thoughts.

Thanks,

Michael